RAND PROJECT AIR FORCE

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Robert Andrews
Chairman, Defense Acquisition Reform Panel
2265 Rayburn House Building
Washington, DC 20515

Dear Representative Andrews:

I am submitting RAND MG-299-AF, *Air Force Service Procurement: Approaches for Measurement and Management*, as my written statement for this Thursday's Defense Acquisition Reform Panel of the House Committee on Armed Services hearing on Measuring Value and Risk in Services Contracts. I will summarize highlights from this research in my oral remarks.

Please note that this research was conducted in fiscal year 2003 and, as such, may not represent current best commercial practices in services acquisition or current policy within the US Air Force.

Sincerely,

Laura H. Baldwin

Air Force Service Procurement

Approaches for Measurement and Management

Laura H. Baldwin, John A. Ausink, Nancy Nicosia

Prepared for the United States Air Force

PROJECT AIR FORCE

Preface

This report documents RAND Corporation research on a portfolio of metrics that may be useful in managing service acquisitions for the Air Force Program Executive Officer for Combat and Mission Support (AFPEO/CM). This research is based on a series of interviews with commercial sector purchasing professionals who are respected by their peers for their successful creation and implementation of what are widely accepted as best purchasing and supply management practices, particularly in the area of service acquisitions.

This research was part of a broader study entitled "Supporting Air Force Procurement Transformation and Laying the Groundwork for Services Acquisition Reform," sponsored by the Air Force Deputy Assistant Secretary for Contracting and conducted within the Resource Management Program of RAND Project AIR FORCE.

This report is designed to assist federal agency personnel seeking to identify opportunities for improving the outcomes of purchased goods and services through application of best practices for purchasing and supply management. As such, it assumes a basic understanding of best commercial purchasing and supply management practices. Readers may also be interested in the following related RAND documents (which are available on the web, see http://www.rand.org/Abstracts):

- *Air Force Procurement Workforce Transformation: Lessons from the Commercial Sector,* John Ausink, Laura H. Baldwin, and Christopher Paul, MG-214-AF, 2004.

RAND Project AIR FORCE

RAND Project AIR FORCE (PAF), a division of the RAND Corporation, is the U.S. Air Force's federally funded research and development center for studies and analyses. PAF provides the Air Force with independent analyses of policy alternatives affecting the development, employment, combat readiness, and support of current and future aerospace forces. Research is conducted in four programs: Aerospace Force Development; Manpower, Personnel, and Training; Resource Management; and Strategy and Doctrine.

Additional information about PAF is available on our web site at http://www.rand.org/paf.

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Summary

To satisfy requirements in the fiscal year 2002 National Defense Authorization Act (U.S. Congress, 2001) to improve the acquisition of services by the Department of Defense, the Air Force established a Program Executive Officer for Combat and Mission Support (AFPEO/CM) who is responsible for management and oversight of a well-defined portfolio of Air Force services acquisition activities. This office is the single point of contact for Air Force services acquisition inquiries and is also responsible for developing long-range plans for cost-effective acquisition of services.

To fulfill its responsibilities, the AFPEO/CM needs metrics to help it monitor compliance with statutory requirements, needs to respond to congressional inquiries about specific acquisitions, and needs to effectively manage Air Force services acquisition activities and organizations. RAND Project AIR FORCE was asked to help develop a portfolio of "overarching" measures that will allow the AFPEO/CM to assess the health of Air Force acquisition activities, diagnose problems, and target improvement efforts. This report describes our recommendations.

To help develop this portfolio of metrics, we considered the experience of commercial firms, which have long had a "strategic" view of purchasing direct materials (goods) because they are direct inputs to production, but have only recently explored applying such approaches to purchasing services. Through interviews with well-respected chief purchasing officers and other executives involved in service acquisitions, through conference participation, and through a

Developing a baseline for these metrics and then tracking them over time present challenges for many firms. Some firms have adopted new management information systems to collect and organize the data for their service acquisitions and have implemented surveys to collect additional data such as supplier satisfaction and customer satisfaction with purchased services, the purchasing organization, and its processes (p. 34).

Recommendations for the Air Force

While not a commercial firm, the Air Force can learn from commercial firms' experiences in managing its service acquisitions. We recommend a balanced portfolio of performance metrics for the AFPEO/CM based on the six major categories of metrics discussed above (pp. 37–50). These metrics are listed in Table S.1.

As with commercial firms, populating these metrics will be challenging for the Air Force. Some of the required data, such as contract costs, exist in Air Force contracting data systems. However, we have concerns about the integrity of these data and their usefulness in determining what services the Air Force purchases (Dixon et al., forthcoming). The Air Force will need to implement new data collection procedures for many of the required data, particularly supplier and customer satisfaction data (pp. 38–50).

Because of commercial sector successes and limited federal government experience with centralized purchasing strategies, we recommend the Air Force adopt a centralized, strategic approach linked to Air Force objectives for managing its purchased services. Proposed Department of Defense–wide commodity councils for selected categories of services are a step in this direction. Given the diversity of service users and their requirements, it will be important to include all-important user groups in the process of developing strategies for categories of services. Other key stakeholders such as small business advocates should be included in the process as well. The Air Force will need to reinforce these efforts with leadership support and incentives that are aligned with Air Force objectives (pp. 50–54).

Acknowledgments

We wish to thank the purchasing professionals who took time to meet with us and teach us about their approaches to managing their firms' service acquisitions. Assurances of anonymity prevent us from identifying them here, but this research would not have been possible without their help.

We thank Steve Busch, AFPEO/CM, for his help in shaping this research to ensure that it addressed the correct issues and concerns.

We are also grateful to our RAND colleagues Lloyd Dixon, Edward Keating, Nancy Moore, and Chad Shirley for their insights on Air Force service acquisitions and data. Nick Castle and Chris Nelson provided helpful comments on an early draft of this report. Judy Lesso, from the RAND library, helped conduct our literature review; Mary DeBold provided document preparation assistance; and Christina Pitcher's skillful editing added clarity to our final manuscript.

Abbreviations and Acronyms

AFPEO/CM	Air Force Program Executive Officer for Combat and Mission Support
CAPS	Center for Advanced Purchasing Studies
CPO	Chief Purchasing Officer
DoD	Department of Defense
FAR	Federal Acquisition Regulations
GAO	General Accounting Office
ISM	Institute for Supply Management
MEO	Most Efficient Organization
NIB/NISH	National Industries for the Blind/National Industries for the Severely Handicapped
PBSA	Performance-Based Services Acquisition
PEO	Program Executive Officer
ROI	Return on Investment

CHAPTER ONE

Introduction

Federal agencies purchase a wide range of goods and services each year. During the 1990s, services became an increasingly important spending category, and they currently represent the largest category of government purchases. The Department of Defense (DoD) is the largest purchaser of services within the federal government, spending approximately $93 billion on services in fiscal year 2002 (FY02). This represents an increase of 18 percent since FY01.[1] Services purchased by the DoD include commercial services for installations and facilities such as building maintenance, grounds keeping, and janitorial services; professional services such as consulting and engineering support; and weapon system services such as research and development, test and evaluation, and maintenance and modification activities.

The DoD has long sought to ensure that its appropriations are used as effectively and efficiently as possible. When acquisition reform—which encompasses a wide range of changes to procurement regulations, policies, and practices—received increasing emphasis during the 1990s, early efforts focused on the purchase of weapon systems and other hardware. However, as services have grown in budgetary importance, acquisition reform for service purchases has become a priority.[2]

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[1] For more details, see GAO (2003), GAO (2002), GAO (2001), and Davis (2001).

[2] In principle, the same kinds of reforms should be applicable to both goods and services. As we will see in Chapters Two and Three, management philosophies and metrics used by commercial firms for categories of purchased goods and services are quite similar.

ited the use of service contracts in the DoD that are not performance based without prior approval.[4]

To encourage the DoD to fundamentally change the way it approaches its services acquisition activities, the FY02 Act included a requirement to demonstrate 10 percent savings in service contract costs (relative to a baseline of FY00 costs) by FY11 through use of performance-based service contracts, increased competition, and management innovations. The DoD was ordered to report estimates of savings to Congress annually through 2005.[5]

The FY02 Act also directed all DoD agencies to establish a management structure for the procurement of services that would be comparable to the structure used for the procurement of products. Each agency was to designate an official to be responsible for the management of the procurement of services. The Secretary of Defense was authorized by the FY02 Act to establish the dollar thresholds and other criteria for the approval of purchases of services, and agencies were required to collect and analyze data on purchases.

The FY03 version of the National Defense Authorization Act (U.S. Congress, 2002b) removed the specific savings goals of the FY02 Act, but assumed that savings would be achieved: Congress established the goal of using Performance-Based Service Acquisitions (PBSA) for 70 percent of all service acquisitions by 2011,[6] and it reduced the FY03 authorization for the purchase of services by $183 million.[7] The FY04 version of the National Defense Authorization Act further reinforces the preference for performance-based service contracts by amending the Office of Federal Procurement Policy Act so that performance-based contracts that satisfy certain conditions

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[4] However, the definition of "performance based" in the act is different than the one in FAR Part 37. The act specifies that a performance-based contract "includes the use of performance work statements that set forth contract requirements in clear, specific, and objective terms with measurable outcomes." See U.S. Congress, 2001, Section 801.2330a.

[5] See U.S. Congress, 2001, Section 802, "Savings Goals for Procurements of Services."

[6] U.S. Congress, 2002b.

[7] U.S. Congress, 2002a, p. 683. This is approximately a 1.2 percent reduction, based on an assumed baseline of $50 billion in DoD service contracts.

and initiatives.[10] One particular area of emphasis is implementation of performance-based contracts for services. The AFPEO/CM office determines whether service contracts are performance based and must approve the use of any contracts that are not performance based.

Early efforts of the AFPEO/CM office have focused on improving the execution of service acquisitions by developing and implementing the Management and Oversight of Acquisition of Services Process. This process implements the FY02 Act by establishing management controls and reviews to ensure the successful acquisition of services and the implementation of PBSA practices (Cardenas, 2004). Over time, the AFPEO/CM organization is expected to take on more strategic roles as well. As the single point of contact for Air Force service acquisition inquiries within the Air Force and the DoD, it will be responsible for developing long-range plans to ensure the effective and efficient acquisition of services. It will also be a key stakeholder in designing and implementing future purchasing and supply management strategies for Air Force services.

AFPEO/CM Metrics

Successful fulfillment of the AFPEO/CM's day-to-day responsibilities requires metrics that monitor compliance with statutory requirements (implementation of PBSA, achievement of savings goals, etc.), help respond to inquiries about specific acquisitions or contracts, and assist in the effective management of the organization (ensuring maintenance of certain skills for the workforce, for example). Metrics will also be required to ensure the effective management of service acquisitions and extract the most value from suppliers so that the Air Force can be a good steward of its resources. RAND Project AIR FORCE was asked to assist in the development of a portfolio of "overarching"

[10] This is not an easy problem. There is a great deal of disagreement in the Air Force about what should be considered a "service" (Ausink et al., 2002). In addition, some services fall under the domain of other PEOs; yet, they are still subject to Air Force policy on service acquisitions.

Each interview was conducted during a two-to-three hour session.[12] The discussions were semi-structured, guided by a list of questions that were provided in advance to the interviewees. The Appendix contains the list of questions used in our interviews.

We also attended two purchasing-related conferences. At a conference on purchasing services sponsored by ISM,[13] we had an opportunity to meet with other purchasing professionals who were seeking ways to improve their acquisition processes as well as ways to measure their success in implementing new approaches. During a roundtable discussion for procurement executives sponsored by the SAS Institute,[14] we participated in discussions moderated by industry experts on topics such as supply base consolidation, procurement management, and managing organizational change.

Finally, we conducted an extensive review of the business literature, including journals and trade publications, to learn more about commercial practices in measuring and managing performance when procuring services.[15] One well-respected resource for such research is the Center for Advanced Purchasing Studies (CAPS).[16]

Project resources did not allow us to independently verify information provided in interviews, in conference presentations, or in the literature. However, we analyzed information from all three sources to seek insights and lessons that were consistent across sources. In the discussion of our findings, we provide specific examples to illustrate points and note areas in which practices differed across sources.

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[12] Two interviews were conducted in person and involved three executives. The other two executives were interviewed over the phone.

[13] "Smart Business: Leveraging the Services Spend," December 5–6, 2002, Scottsdale, Arizona.

[14] Procurement Executive Roundtable, June 5, 2003, Ritz-Carlton Hotel, Arlington, Virginia.

[15] We used a variety of search terms for the business literature review, including purchased services, service contracts, services and purchasing, and metrics and services. Judy Lesso, from the RAND library, conducted the literature search for us.

[16] More information about CAPS can be found at www.capsresearch.org.

careful to ensure that metrics reinforce and measure progress toward achieving both short-term and long-term corporate objectives.

Organization of the Report

The remainder of this report is organized as follows. Chapter Two discusses the management issues associated with service procurement in the commercial world, including the formulation of purchasing strategies, the use and composition of commodity councils (cross-functional teams), and the use of performance incentives. Chapter Three describes how commercial firms use metrics to monitor progress in achieving corporate goals, including types of metrics used, data collection, and how results are reported. Chapter Four discusses our recommendations for how the Air Force can adopt and adapt relevant management lessons and metrics from the commercial sector. This chapter highlights the use of a balanced portfolio of metrics to monitor the health of Air Force acquisition, potential difficulties in data collection, and the implementation of commodity councils for services. The Appendix contains the questionnaires that we used to guide our interviews.

CHAPTER TWO

Commercial Strategies for Service Procurement

Increased spending on services is not unique to the federal government; commercial firms are also spending more in this area. CAPS Research noted in 2002 that services spending in the broader economy "represents a large and growing segment of organizations' overall purchases" (CAPS Research, 2002). A year later, CAPS reported that in a survey of firms with annual revenues ranging from less than $1 billion to over $60 billion, firms on average expected their spending on services to increase 13 percent over the next five years, with more than half of the firms in the survey expecting their spending on services to increase on average by 22 percent. Overall services spending for these firms represented 31 percent of the total spending on purchases, and 11 percent of total revenue (CAPS Research, 2003).[1]

Because direct materials, or "goods," are direct inputs to production and were in the past more significant drivers of expenditures, commercial firms have long viewed them as obvious candidates for "strategic" management. That is, firms have recognized the importance of purchasing and supply management approaches—such as developing closer relationships with key suppliers and undertaking supplier development efforts—that improve the likelihood of achieving the long-term goals of the corporation. In contrast, our interviews indicate that there has been much less emphasis on applying similar approaches to service acquisitions. Responsibility for pur-

[1] This is consistent with a recent Aberdeen Group survey of 77 business and supply chain executives. On average, services represented 34 percent of total purchases for survey respondents' organizations (Aberdeen Group, 2003).

Developing Purchasing Strategies

Purchasing strategies have many dimensions such as the

- definition of demand, including the degree of standardization across customers
- solicitation plan
- source selection criteria
- terms and conditions of the contract
- optimal size of the supply base
- nature of the customer-provider relationship.

The optimal choice of these strategies is influenced by a variety of factors, including characteristics of the purchased service (as well as market conditions) and the firm's objectives. For example, the degree of standardization of the purchased service is affected by the diversity of demands for the service across the organization. Firms seek to balance the benefits of standardization across users—greater consistency in services and improved cost control (Avery, 1999)—with the benefits to users of tailoring services to their specific needs.

Similarly, determining the "right" number of suppliers for the company could mean trying to decrease *or* increase the number of suppliers providing a given good or service. A company with too many suppliers might not have sufficient leverage over any individual supplier to reduce costs or increase performance.[3] On the other hand, a company with too few suppliers could be at risk if suppliers do not feel competitive pressure to innovate and improve or if suppliers have difficulty fulfilling their commitments. The "right" number of suppliers will depend on the importance of the good or service to the company, including the risks inherent in interruption of its provision, and the potential for savings through greater consolidation.[4]

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[3] It is also difficult to form strategic relationships and undertake supplier development activities with a large supply base.

[4] See MacLean (2002) for a discussion of supply base "rationalization."

suppliers and a forecast of future trends (Richter, 2003). American Airlines buyers incorporate market research into their formal commodity strategies as well (MacLean, 2002).[5]

Research on characteristics of internal demand for a service is also important. The level of demand, the diversity of needs at one location or across units at different locations, and the consequences of poor performance of the service must all be understood before a strategy can be developed.[6] The timing of demand—e.g., ongoing service, periodic service, or one-time service—is also important. One of our interviewees emphasized that if a service is going to be purchased only once, the chosen approach to negotiating with and selecting among potential providers might be very different from the approach used if the firm is interested in frequent purchases of the service.

Strategies and Commodity Councils

In our discussions with commercial firms, we learned that cross-functional teams called commodity councils are now being used to develop strategies for managing firm-wide procurement of categories of goods and/or services.[7] In developing its strategy, the goal of a council is to help maximize the firm's competitive advantage by extracting the maximum value for the commodity from its suppliers.[8] Ausink, Baldwin, and Paul (2004) provide an overview of commodity council activities associated with developing procurement strategies.

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[5] Avery (1999) describes Brunswick Corporation's market research and strategy documentation process.

[6] Brunswick Corporation formally surveys all key users to define internal demand for purchased services (Avery, 1999).

[7] See also Richter (2003) and Duffy and Flynn (2003).

[8] While the goal of a council is to provide a firm-wide approach to purchasing the service, we learned from the literature and the ISM conference that some firms, such as American Airlines and Microsoft, do not mandate that everyone adhere to procurement strategies (MacLean, 2002; Avery, 2003). That is, sometimes units can purchase outside the company-wide strategy. In these cases, however, cost and quality performance should be closely monitored.

affect the size of annual bonuses as well as future opportunities for promotion.

Achieving corporate objectives and evaluating commodity council performance depend on the establishment of appropriate measures of success. The next chapter discusses commercial practices in using metrics for the purchase of services.

CHAPTER THREE

Commercial Firms' Use of Metrics to Manage Service Procurements

Choosing the right set of purchasing and supply management metrics and performance thresholds to provide the information necessary for decisions affecting purchasing strategies and populating those metrics with reliable data are difficult tasks. The business literature is full of case studies and surveys of firms that are unhappy with their current measurement systems (see, for example, Morgan, 2000; and Monczka, Trent, and Handfield, 2002). In this chapter, we discuss measures that our study participants recommended as providing the information they need to better manage their service expenditures.

The firms we interviewed emphasized the use of results-oriented metrics for purchased services rather than process metrics. They focus on how the outcomes of their purchasing and supply management activities for services support corporate objectives, and they are less concerned about the implementation of specific practices. Some metrics are retrospective assessments of past performance. Others are forward-looking predictors of future problems or successes.

The primary outcome categories include cost, quality, supplier satisfaction, implementation of new initiatives, and special interest issues. These are analogous to the categories of metrics they use to manage their purchased goods.[1] Metrics are also used to manage the

[1] An additional outcome category tracked for commodities was technology. In our interviews, this category had less relevance for service expenditures.

Table 3.1
Cost Metrics

Cost Metrics	Description
Reduced costs (via prices)	Costs relative to previous year Costs relative to other divisions or units Costs relative to other regions
Change in costs versus change in market index	Change in firm costs for an individual type of service relative to change in a market cost index for that service
Return on investment	Dollar savings divided by procurement spending

firm. In this type of benchmarking activity, the firm compares costs for a particular service to the cost of that service in other divisions within the firm to assess whether there are opportunities to reduce costs. Adjustments are made for regional variation in prices or other market conditions.[3]

Two firms noted that it is necessary to account for exogenous market conditions (that is, those that are not influenced by the firm's actions) when evaluating the performance of the purchasing organization with respect to cost. For example, the cost of programming services rose sharply during much of the 1990s, independent of the actions of any particular firm. Rather than looking only at each firm's change in cost, these companies emphasized that cost metrics should account for market factors that affect costs. For example, cost savings are measured as the internal change in cost (relative to those costs last year) compared to the change in the relevant market cost index. The comparison is made at the individual service level. The goal of each service commodity council within the purchasing organization is to beat the market index for that service.

Table 3.2 illustrates the calculation of this metric for two hypothetical services. In this example, the market cost index for Service A increased 5 percent during the period, and the firm's costs for this

[3] Adjustments for differences in the nature of services purchased need to be made in this type of comparison as well.

impossible because information about how much competitors are paying for similar products or services is carefully guarded. This type of comparison is possible only in special circumstances such as the merger of two former competitors.

A third cost metric is the return on investment (ROI) for procurement strategies, which measures the cost benefits associated with implementation of new aspects of procurement strategies. These can include implementation of new practices and acquiring new skills through training and hiring programs. The ROI is measured as the reduction in expenditures divided by the cost of new procurement activities that led to the realized savings. Based on his experience, one CPO indicated that he strives for a three-to-one ratio between cost savings and investments in improving his organization's procurement capabilities, although lower levels of benefits could still be used to justify investments. This measure provides a financial justification for desired new procurement activities, which typically struggle for resources, particularly within firms seeking to reduce their cost structure. It can also serve as a measure of the effectiveness of the procurement strategy and implementation.

Implementation Considerations. Effective implementation of cost metrics requires that comparisons be valid and informative. Although used successfully by the commercial firms we surveyed, the metrics presented above pose considerable implementation challenges.

Each of the cost measures in Table 3.1 is based on a comparison of costs—across time, divisions, and/or regions. Comparing costs of services over time works best for those services that are purchased frequently or on an ongoing basis, which ensures that the firm has sufficient data for comparison. For periodic or one-time purchases, data are often insufficient to make valid comparisons. In order for the comparison across time to be informative, the firm must account for changes in what they bought over time and in market conditions. For example, changes in the service purchased may include changes in service scale (e.g., number of square feet cleaned), scope (e.g., adding recycling to a refuse contract), or the level of quality (e.g., faster response times) (see Shirley, Ausink, and Baldwin, 2004). Changes in

service in the firm's overall expenditures. Often firms use weights corresponding to the individual service's share of expenditures.

Quality

The second most often cited category of metrics was quality.[6] Quality is a difficult concept to measure for services. Unlike goods purchases, simple metrics such as the percentage of defective products are not relevant for services.[7] Among the firms we interviewed, service quality is most often measured in terms of whether the end user or demander of the service was satisfied (i.e., customer satisfaction) or in terms of reliability of the service (see Table 3.3).

Customer satisfaction is measured for overall performance as well as performance among specific dimensions that are important to customers (e.g., responsiveness). For ongoing or continuous services such as telecommunications or network access, service reliability may be tracked through the number of service interruptions. Another in-

Table 3.3
Quality Metrics

Quality Metrics	Description
Customer satisfaction ratings	Responses from customer satisfaction survey regarding • overall satisfaction • satisfaction with specific dimensions of performance
Service reliability	Frequency of service interruptions Continuity of service

[6] Krowinski and Steiber (1996) quote management expert Peter F. Drucker as saying that acquiring a customer comes first, then retaining the customer, and finally maximizing profitability from the relationship with the customer. High quality is important for retaining a customer, and though Krowinski and Steiber focus on the benefits of high customer satisfaction in the health care business, other organizations find analogous benefits in high-quality service.

[7] Smeltzer and Ogden (2002) discuss measuring the quality of purchased services versus materials.

communicated to all customers. Otherwise, customers may have inappropriate expectations that lead to distortions in satisfaction ratings.[10] Customer representation on commodity councils can also help mitigate these problems.

Like the cost metrics, quality metrics are evaluated separately for each type of service. To generate an overall quality metric, the performance of individual services can be aggregated to the firm level through a weighting scheme, such as the relative importance of each service in the firm's overall expenditures.

Supplier Satisfaction

A third type of metric viewed by interviewees as important is supplier satisfaction with the customer. The purpose of a supplier satisfaction assessment is to ensure that the buying firm continues to be able to conduct business with the best suppliers. Thus, this is primarily a forward-looking metric. Interviewees noted that access to good suppliers is critical to their firms' future success. One interviewee indicated that it is particularly important to know how suppliers view the buying firm relative to the firm's competitors. Richter (2003) recommends that a buying firm should seek to be viewed as one of its supplier's best customers, not necessarily the easiest. Table 3.4 lists two types of supplier satisfaction metrics discussed in interviews.

Table 3.4
Supplier Satisfaction Metrics

Supplier Satisfaction Metrics	Description
Supplier satisfaction ratings	Responses from supplier satisfaction survey • Overall satisfaction • Satisfaction with specific dimensions of interactions • Satisfaction with different parts of the buying organization
Complaints	Supplier-initiated concerns

[10] See also Duffy and Flynn (2003).

New Initiatives

A fourth category of metrics focuses on tracking and supporting implementation of specific initiatives to improve outcomes of purchased services. Examples of such initiatives include supply base rationalization (i.e., creating a supply base that is the right size and composition), supplier development, and the development of personnel with more sophisticated purchasing and supply management skills (discussed below).

Interviewees were careful to distinguish between process and outcome metrics when measuring implementation of specific initiatives. Process metrics are used to track progress with specific parts of an implementation plan, and thus are forward looking. Outcome metrics are used to measure initiative results against prespecified goals. As an example, for a supplier development initiative, process metrics might track the number of people working on these efforts and the number of projects under way at a point in time. Outcome metrics may track whether expected savings or performance improvements were achieved. Table 3.5 provides illustrative examples of initiative metrics based on our interviews.

Implementation Considerations. Developing initiatives, implementation plans, goals, and their associated metrics is a challenging, time-consuming process. For example, analyses of firm expenditures

Table 3.5
Illustrative Initiative Metrics

Example Initiative	Potential Process Metrics	Potential Outcome Metrics
Supply base rationalization	Reductions in nonstrategic suppliers Reductions in sole-source situations	Savings Responsiveness Customer satisfaction
Supplier development	Number of people involved Number of projects	Savings Improved performance
Personnel development	Number of training hours per year, per employee	Mastery of desired skills

Table 3.7
Internal Management Metrics

Internal Management Metrics	Description
Internal customer satisfaction	Dollars spent outside the corporate strategies (maverick buying) Satisfaction rating based on internal customer surveys
Personnel training and retention	Process: Number of training hours per employee per year. Outcome: Mastery of desired skills Retention of high-quality employees
Ethics violations	Number of violations per year

cated that their firms track internal customer satisfaction, training and retention of personnel, and adherence to procurement ethics policies. These are summarized in Table 3.7 and are discussed below.

Internal Customer Satisfaction

Internal customer satisfaction metrics evaluate how well the purchasing organization is meeting the needs of its internal customers. These customers are the firm's business units that utilize (or should utilize) the procurement organization's services to buy the goods and services they need. This metric is both retrospective—how well the organization performed in the past—and forward-looking—an indicator of how effective the organization will be in shaping corporate purchasing in the future. The commercial firms in our sample tracked internal customer satisfaction using both indirect and direct evidence.

The prevalence of so-called "maverick" buying can be used as an indirect measure of internal customer satisfaction. Maverick buying is the amount of buying (measured in dollars) that circumvents the corporate purchasing strategy, e.g., making travel arrangements on one's own instead of using the corporate travel department and agreements, potentially leading to increased purchase costs. Significant levels of such ad hoc buying could indicate that there is some dissatisfaction with the purchasing organization, the purchasing strategy, or its implementation. Individual purchases must be analyzed to determine the source of the problem. For example, when FedEx's purchasing

Personnel Training and Retention

Interviewees and ISM conference participants emphasized that an essential element of any purchasing organization's current and future success is the quality and expertise of its personnel. Conducting analyses to design and then implement optimal purchasing strategies requires sophisticated skills. As a result, analyses of required skills relative to current skills and development of individual training plans are explicit elements of the business plan for one purchasing organization we learned about in our interviews.

This firm tracks both process and outcome metrics with respect to training. High-level process metrics track training levels such as the number of training hours per employee per year.[11] Outcome metrics for training track the success of training programs by monitoring how well trainees master required skills. This firm uses professional certifications and assessments of supervisors to indicate mastery.[12]

Retention of high-quality (i.e., highly-trained, effective) personnel is a natural complement to training. Thus, the firm referenced above that has workforce development initiatives also tracks the retention rates of its high-quality personnel.

Implementation Considerations. Evaluating training requirements and training programs and measuring mastery of desired skills are difficult tasks. See Ausink, Baldwin, and Paul (2004) for a discussion of the advantages and disadvantages of alternative skills evaluation and training evaluation procedures.

Even for the most highly valued employees, the optimal staff turnover rate may not be zero percent (100 percent retention). Some turnover is deemed desirable in many cases, for example because of the opportunity to gain new ideas, and there are costs associated with retaining experienced, high-quality staff who are sought after by other

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[11] Such a high-level training metric aggregates information about individuals' progress toward meeting their own training requirements based on their personal skill development plans.

[12] The United States Postal Service and J.C. Penney went through similar workforce development efforts and used certifications and supervisor/employee assessments to identify needs and measure progress (Strange, 2002; Hanson, 2002). See also Ausink, Baldwin, and Paul (2004) for more discussion about procurement personnel training.

Reporting Metrics to High-Level Corporate Management

Purchasing executives report important information about their organizations' activities to their firms' leadership on a regular basis. Interviewees indicated that their firms' corporate managers are primarily interested in cost, quality, and supplier satisfaction metrics. These measures are typically aggregated to the corporate level based on expenditure shares. However, reports on individual services are also encouraged. Particularly successful efforts for individual types of services are highlighted to denote the purchasing organization's progress. One interviewee also highlights so-called missed opportunities, such as the prevalence of maverick buying of goods or services that does not serve the overall corporate strategy and undermines savings efforts. By contrasting missed opportunities with successful efforts, this person gains corporate management's support for efforts to expand the use of successful practices to new areas.

The frequency of reports to corporate management depends on the type of metric. For metrics such as costs, corporate management of firms in our study reviews metrics on a quarterly basis. Internal customer satisfaction metrics may be reported somewhat less frequently (e.g., semiannually). Supplier satisfaction metrics are reported based on the frequency of the survey (and thus may be reported as infrequently as every two years). Particular problem areas (or successes) and special initiative metrics are reported as necessary.

CHAPTER FOUR

Recommendations for the Air Force

The previous two chapters described well-respected commercial practitioners' approaches to measuring and managing the outcomes of purchased services. In this chapter, we describe how the AFPEO/CM could adopt and adapt several of these practices to improve Air Force service outcomes and support for its mission objectives.

The Air Force is not a commercial firm; it is different in important ways. For example, while it is crucial for the Air Force to be fiscally responsible with the taxpayers' money, the ability to perform its mission successfully will always be more important than meeting budget constraints or reducing costs. The Air Force's ability to implement optimal supply strategies is constrained by its obligations to meet a broad range of socioeconomic and other special interest objectives. And it has limited ability to hire experienced personnel who bring needed expertise to positions in the upper tiers of its organizations or to provide incentives to its personnel to align their actions with high-level objectives.

However, the Air Force is in the process of implementing a number of well-respected commercial purchasing and supply management practices, including the use of commodity councils to shape optimal strategies for acquiring and managing categories of goods and services. As part of this process, there are opportunities for the Air Force to benefit from implementation of many of the commercial practices discussed in this report.

Table 4.1
Proposed Portfolio of Metrics for the AFPEO/CM

Metrics Category	Potential Metrics
Cost	Change in costs versus change in market index
	Actual versus projected post-study costs for recently completed A-76 studies
	Procurement ROI
Quality	Customer satisfaction with purchased services
	Reliability or continuity of services
Supplier satisfaction	Supplier satisfaction with doing business with the Air Force
New initiatives	Process and outcome metrics for specific initiatives, which may include • purchasing and supply management • management and oversight of acquisition of services process • customer education
Special interest	Compliance • Percentage of service dollars and contracts awarded to different categories of small businesses • Percentage of service contracts that are performance based
	Other • Percentage of A-76 studies or slots that were successfully competed within the required time frame • Number of protests resulting from A-76 awards • Percentage of key staff for A-76 studies that remain in their jobs throughout those studies • Percentage of provider personnel that remain in their jobs for a given period of time
Internal management	Internal customer satisfaction with the Air Force purchasing process and personnel
	Percentage of dollars associated with purchases executed outside the Air Force's preferred strategy (i.e., maverick buying)

Change in Costs Relative to the Appropriate Market Index. This metric is relevant to services that have already been outsourced. Ideally, it is based on total ownership costs, rather than prices paid, to take into account the additional costs associated with procuring and

This measure also should be tracked for individual categories of services and aggregated across types of services by weighting the service-specific metrics by the proportion of expenditures associated with each.

Procurement ROI. Commercial experience suggests that as the Air Force implements commodity councils and other well-respected purchasing and supply management practices, it will need to make investments in its procurement personnel, organizations, and activities. Such investments may include training to develop the skills needed to design and implement more sophisticated purchasing and supply management activities, enhancing the workforce by hiring personnel with specific technical skills (such as service industry experts), and so forth. To justify these investments, the Air Force could measure the cost savings benefits associated with specific types of investments and compare them to the investment cost.

An alternative approach is to measure the net effectiveness of Air Force procurement in reducing service acquisition costs, i.e., achieved savings versus the procurement organization's budget.

Existing Data. These recommended cost metrics require detailed information about the costs incurred by the Air Force over time for purchased services; market indices; A-76 baseline, projected, and realized costs; and the cost of new procurement activities.

For previously outsourced services, the Air Force has some information about expenditures for services on a contract-by-contract basis within the DD350 database.[3] However, we have concerns about the quality of those data, specifically their ability to accurately capture the full range of services the Air Force purchases and their contract costs (Dixon et al., forthcoming). In addition, the DD350 database does not include all transactions. Contract actions for less than $25,000[4] and government purchase card expenditures are tracked in

[3] This database tracks descriptive information such as the good or service purchased, the dollar amount, and the supplier for virtually all contract transactions greater than $25,000.

[4] Some of the smaller actions can be found in the DD350 database, but they are not recorded there systematically. Most of these small transactions are aggregated monthly in the DD1057 system.

mation about expected levels of performance is communicated broadly to customers to ensure that customer assessments are appropriate and consistent with contractual agreements.

Writing good survey questions is always challenging. However, there are resources that can help, including web sources.[5] Surveys may use a numeric scale (e.g., ratings from one to ten) to measure the level of satisfaction and/or allow open-ended comments and suggestions. Prior RAND research suggests that firms have varying philosophies about conducting internal customer satisfaction surveys (Baldwin, Camm, and Moore, 2000; Baldwin and Hunter, 2004). Firms differ in the frequency of surveys, the percentage of customers surveyed, and the types of surveys used. For services performed only once or infrequently, surveys should closely follow provision of the service. For frequent or ongoing services, a useful approach might be to conduct surveys every six months, randomly selecting representatives from approximately 25–50 percent of customer organizations for each survey (so that all customer organizations are surveyed once every one to two years). Web-based surveys may also significantly reduce the costs of conducting a survey.[6] Surveys can be performed by Air Force procurement personnel or by third-party consultants.

Survey response rates are a concern, so it would be wise to seek feedback from customers on any proposed approach prior to implementation. The ease of making detailed comments in a web-based format may help increase the willingness of customers to participate. Also, as part of a prior study, we learned of a commercial firm that increased its response rates by offering an incentive for participating: All respondents were entered into a raffle, with a chance to win a small gift.

Reliability or Continuity of Services. For frequently performed or continuous services, such as cell phone service or network access, service reliability or continuity can directly affect the Air Force's abil-

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[5] A web search on "customer satisfaction surveys" yielded many web sites, including QuestionPro.com.

[6] There are web sites that can facilitate creation and implementation of web-based surveys, e.g., SurveyMonkey.com.

seek to determine suppliers' perspectives about how easy it is to do business with the Air Force, what actions the Air Force could take to help develop or enhance mutually beneficial strategic partnerships, whether Air Force procurement personnel are treating suppliers fairly, and so forth. Ideally, different parts of the survey should target different divisions within suppliers' organizations. Because suppliers deal with many different parts of the Air Force, such a survey could also be used to identify successful practices and lessons from among individual internal Air Force buying organizations that could be shared more widely across the Air Force.

Given the intricacies of similar surveys found in the commercial sector, the Air Force may want to utilize a third-party consultant to help design and implement the survey, at least initially. The costs will need to be weighed against the benefits when determining the best frequency and the number of suppliers chosen for the survey. The Air Force could consider initially surveying firms biennially (either all at once or 50 percent of providers each year) and targeting its most important suppliers first, i.e., those that provide services the Air Force spends a lot of money on or services that are important for mission execution. It may also want to include a random selection of other suppliers. As the Air Force gains experience with this practice, it may want to increase or decrease the number of firms surveyed or the survey frequency based on the results of prior surveys or timing of any new initiatives that may affect supplier satisfaction.

Initiatives and New Policies

This category of metrics would be used to track implementation of initiatives and policies of particular interest to the AFPEO/CM. Both outcome-oriented and process-oriented metrics are important so that the AFPEO/CM can track progress against goals and adjust implementation as needed. The specific metrics tracked should evolve over time to reflect experience with past efforts and any new initiatives. Currently, the following may be of interest to the AFPEO/CM: implementation of well-respected commercial purchasing and supply management practices such as performing in-depth market research or writing outcome-oriented statements of work, implementation of

Special Interest

As with initiatives and new policies, the AFPEO/CM needs the ability to monitor information on special interest issues. In this section, we describe a few metrics related to important issues that we have heard discussed within the AFPEO/CM and Air Force contracting communities. As such, we hope that these metrics are both relevant and illustrative; however, we do not view this as a comprehensive list.

Some issues are of interest to the AFPEO/CM because of Air Force obligations to comply with external mandates. For example, Congress has mandated that the Department of Defense award 23 percent of its contract dollars directly to small businesses (as well as specific subcategories such as small disadvantaged businesses).[7] Because small businesses provide many services to the Air Force, the AFPEO/CM may want to monitor the *percentage of service dollars and contracts awarded to different categories of small businesses.*

In Chapter One we described the requirements for the Air Force to implement performance-based service contracts and the AFPEO/CM's role in this implementation. Thus, the AFPEO/CM will also need to monitor the *percentage of service contracts that are performance based* to track progress toward meeting these goals. Implementation of performance-based practices requires discretion to appropriately align the approach with the nature of the service requirements; thus, this type of metric has the same measurement challenges discussed above.

Other potential issues of interest include the following. The current administration strongly supports federal agencies opening a portion of their personnel slots associated with commercial-like activities to competition with private sector firms through A-76 studies. The AFPEO/CM is responsible for execution of A-76 studies that include more than 300 slots and thus may want to monitor the *percentage of A-76 studies or slots that were successfully competed within the required time frame.* Similarly, the AFPEO/CM may want to track the *number*

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[7] See the DoD Office of Small and Disadvantaged Business Utilization web site for more information about DoD goals. Online at http://www.acq.osd.mil/sadbu/index.html (as of October 12, 2004).

Internal Management

The last category of metrics focuses on the effectiveness of Air Force purchasing organizations' activities, that is, how well they are meeting the service acquisition needs of their internal Air Force customers. This is also an indicator of how effective these organizations will be in the future as they seek to truly transform Air Force purchasing.

We recommend two related metrics here. The first is *internal customer satisfaction with the purchasing process and personnel,* measured through an internal survey as discussed in the previous chapter. The second metric is the *percentage of dollars associated with purchases executed outside of the Air Force's preferred strategy (i.e., maverick buying).* As service commodity councils begin devising optimal purchasing and supply management strategies, the second metric would track the amount of service expenditures that fall outside of these strategies. As noted in Chapter Three, one of our interviewees referred to these as "missed opportunities." This metric should be measured for each category of services and then aggregated by weighting according to the size of Air Force expenditures in those categories.

Existing Data. As part of its ongoing procurement transformation, the Air Force contracting community discussed surveying its customers to learn how well their needs are supported. To our knowledge, this is still planned but has not yet been implemented; information about customers' satisfaction with the purchasing process and personnel is not currently available.

Maverick buying can be difficult to measure. As the Air Force implements its commodity councils for services, it will have an opportunity to begin analyzing purchases by commodity area. To the extent that purchases are captured in the DD350 database, the description of the purchase may allow the commodity council to track total expenditures in the commodity area and then compare those to the purchases that are executed according to the chosen commodity strategy.

Overarching Data Issue

In addition to the data needs and issues discussed above, we are concerned about a lack of detailed information about the types of services

across organizations, e.g., installation support, information technology support, and advisory and assistance services. Currently, the Department of Defense uses a decentralized approach for purchasing many services. For example, in the Air Force, installation support services are primarily purchased at the local base level. For weapon systems, management support services (e.g., advisory, assistance, and engineering support) are primarily purchased by individual program offices.

However, commercial sector trends as well as public sector experiences with centralized contracts, such as government travel service agreements, suggest that there may be significant opportunities to leverage the military's purchasing power through more strategic, centralized approaches within the Air Force, DoD, or even the federal government.

The DoD is in the process of implementing commodity councils for services that are purchased across the military branches. According to draft plans shared with us, the three proposed service areas are miscellaneous professional services, management advisory services, and miscellaneous and general information technology services. Through analyses of expenditures and other assessments, these councils will be designing optimal strategies for purchasing these services to improve performance and cost outcomes for customers across the DoD. In addition, we believe the expertise developed by these commodity councils may be useful for managing A-76 studies and helping MEOs develop their proposals.

The Air Force purchases many other types of services as well and should consider implementation of its own commodity councils for some of these services. In some cases, it may make sense to combine related goods and services into a single council and construct a joint purchasing strategy for them, e.g., equipment and maintenance support.[9]

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[9] The Air Force is beginning to implement commodity councils for several categories of goods; see Ausink, Baldwin, and Paul, 2004, for a discussion. The Air Force recently published a concept of operations for commodity councils (U.S. Air Force, 2003).

"war-fighter" concerns are represented, but also that there is significant continuity in membership and retention of lessons learned over time.

Leadership and Incentives

Our study participants indicated that the Air Force needs strong leadership to successfully improve the management of its purchased services over time. High-level proponents of change can provide help in breaking down resistance to purchasing changes and limiting maverick buying that occurs outside the optimal strategies. Indeed, creation of the AFPEO/CM office is a step in this direction.

It is important for Air Force leadership to communicate the new approach internally at all levels of the organization and to stress that the Air Force is committed to the long-term process of moving toward strategic, more centralized management of service expenditures. External communication to suppliers is needed as well.

Incentives for Air Force personnel and providers could be used to reinforce this commitment to change. As the Air Force implements its commodity councils for services and goods, the performance of these councils should be evaluated relative to their appropriate market indices, customer satisfaction ratings, or other important performance goals. Then councils could be ranked against one another in order of success in meeting goals.[12] These rankings could then be communicated widely throughout the procurement workforce and Air Force leadership.

In addition, it would be helpful to tie individuals' promotion opportunities and, if possible, compensation to their own or their councils' performance. However, even if such formal incentives are not possible, ranking councils and communicating the results can provide powerful informal incentives to meet goals.

The Air Force already has experience tying providers' award fees and contract length to performance, as well as taking past performance into account during source selection decisions for new contracts.

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[12] This idea is included in the Air Force's concept of operations for commodity councils (U.S. Air Force, 2003).

APPENDIX

Interview Questions

This appendix contains the interview questions we used to guide our discussions with experts. These questions were provided to interviewees in advance.

Interview Protocol for Chief Purchasing Officers

Background

Before we begin, it would be helpful for us to learn about your background and experience.

How long have you been with this organization? How long have you been in your current position?

What is the size of your purchasing organization—in terms of budget and staff?

Which services has your firm outsourced?

Did you outsource these through many or few contracts?

What is the typical length of your service contracts?

How were your metrics selected?

Was the development of your metrics an iterative process?
How often is the choice of metrics reevaluated?

May we have an example (sanitized, if necessary) of any performance reports compiled by your office?

Can you think of additional metrics that may be useful to the AFPEO/SV? [1]

Roles and Responsibilities of Your Organization

To help us put these metrics in perspective for the AFPEO/SV, it would be useful to better understand your organization's roles and responsibilities.

For the questions below, if your organization is not responsible for these activities, who within your firm is responsible?

Policy

Do you determine or can you influence your firm's services acquisition policies and practices?

Do you determine what services are eligible/appropriate for outsourcing?

Do you determine or can you influence the training program (or job requirements) for personnel involved in purchasing services?

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[1] At the time of the study, the AFPEO/CM office was called the PEO for Services (AFPEO/SV).

Budget Authority

Can you influence your firm's budget(s) for purchased services and/or allocation of the budget across service areas?

Other Roles and Responsibilities

Do you have other roles and responsibilities associated with your firm's purchased services?

AFPEO/SV Roles and Responsibilities

Can you think of any additional authority, roles, or responsibilities the AFPEO/SV needs in order to be successful in ensuring that the Air Force's large service acquisition activities meet the Air Force's needs?

Additional Information Sources

Do you participate in any professional or trade organizations? If so, which ones?

What other resources do you use to remain informed of advances in best practices (e.g., journals, seminars, meetings, etc.)?

Can you think of other sources of information that might be useful for our study?

Do you have any suggestions for other potential interviewees?

Can you think of anything we should have asked, but didn't?

Do you ask your providers for feedback on the quality of your business interactions, e.g., in negotiating a service contract or in the day-to-day implementation of the contract?

If so, which metrics do you use to track this feedback?

Are the metrics discussed above your ideal metrics, or are they the best available? Please explain.

If not ideal, what would be your ideal metrics?

How do you collect data for these metrics?

Did you implement a special data collection effort for this purpose, or are you able to draw from existing data systems?

How often do you review these metrics?

If performance is poor in an area, do you have "diagnostic" metrics to help you understand what needs to be addressed in order to improve?

How were your metrics selected?

Was the development of your metrics an iterative process? How often is the choice of metrics reevaluated?

May we have an example (sanitized, if necessary) of any performance reports compiled by your office?

Can you think of additional metrics that may be useful to the AFPEO/SV?

Do you determine the source selection criteria for service contracts? Do you make final source selection decisions?

Do you participate in formal performance reviews with your firm's service providers?

How often?
What information do you examine in these reviews?

Do you determine the level and types of incentives (positive or negative) used in contracts?

Do you make decisions about incentive awards to providers?

Budget Authority

Can you influence your firm's budget(s) for purchased services and/or allocation of the budget across service areas?

Other Roles and Responsibilities

Do you have other roles and responsibilities associated with your firm's purchased services?

AFPEO/SV Roles and Responsibilities

Can you think of any additional authority, roles, or responsibilities the AFPEO/SV needs in order to be successful in ensuring that the Air Force's large service acquisition activities meet the Air Force's needs?

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